Notice of Allowability	Application No.	Applicant(s)	
	10/656,355	MATHESON ET AL.	
	Examiner	Art Unit	
	CAROLINE ARCOS	2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amendment filed 08/25/2008 and interview on 11/13/2008*.

2. ☒ The allowed claim(s) is/are *1,3-18 and 20-30 now renumbered as claims 1-28.*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Meng-Ai An/
Supervisory Patent Examiner, Art Unit 2195

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

2. Authorization for this examiner's amendment was given in a telephone interview with Mr. Robert Racunas on 11/13/2008.

3. Replace all prior claims with the following:

1. A computer-implemented method comprising:

receiving a plurality of task containers, each said task container representing a task to be scheduled at a computer, where each said task container includes a grouping of a plurality of resources containers, wherein each said resource container includes resource information that specifies one or more resources required for the represented task and selection criteria to select from the one or more resources, and wherein each said task container further includes an interface function that, when called, determines a pair-wise probability that the task represented by another task container will influence the task represented by the called task container based on a current schedule state of scheduled tasks, selection criteria specified in resource containers of the another task container, and selection criteria specified in resource containers of the called task container;

generating a total cost for each task based on pair-wise costs for each task calculated from determined pair-wise probabilities that the task will influence each other task in the plurality of task containers; and

scheduling the task with the least total cost.

2. (Canceled)

3. A method as recited in claim 1 wherein the each selection criteria specifies a relationship selected from a group consisting of:
an "AND" relationship indicating that all of a plurality of the resources are required to complete the represented task;
an "XOR" relationship indicating that only one of the one or more resources is required to complete the represented task; and
an "OR" relationship indicating that one or more of the resources are required to complete the represented task.

4. A method as recited in claim 1 further comprising:

receiving a timeslot definition associated with each of the plurality of tasks or resources, the timeslot definition defining a required timeslot for the associated task or resource.

5. A method as recited in claim 4 wherein the timeslot definition comprises an early start indicator, a late finish indicator, and a duration indicator.

6. A method as recited in claim 1 further comprising:

receiving a constraint describing a time constraint between two tasks in the plurality of tasks; and

scheduling the two tasks based on the constraint.

7. A method as recited in claim 1 further comprising:

determining the pair-wise probability for a pair of tasks that a first task in the pair of tasks influences a second task in the pair of tasks based on the resource information; and

adjusting the pair-wise cost of the pair of tasks based on a function of the pair-wise probability that the first task in the pair of tasks influences the second task in the pair of tasks.

8. A method as recited in claim 1 further comprising:

determining the pair-wise probability for a pair of tasks that a first task in the pair of tasks supports a second task in the pair of tasks based on the resource information; and

if the first task supports the second task, reducing the pair-wise cost of the pair of tasks based on a function of the pair-wise probability that the first task supports the second task.

9. A method as recited in claim 1 further comprising:

determining the pair-wise probability for a pair of tasks that a first task in the pair of tasks competes with a second task in the pair of tasks based on the resource information; and

if the first task competes with the second task, increasing the pair-wise cost of the pair of

tasks based on a function of the pair-wise probability that the first task competes with the second task.

10. A method as recited in claim 1 wherein the generating comprises:

selecting a first task from among the plurality of tasks;

querying the task container of the first task for the pair-wise probabilities; and

summing the pair-wise probabilities to form the total cost associated with the first task.

11. A method as recited in claim 1 wherein the resource information comprises preference information describing preferences of the one or more resources.

12. A method as recited in claim 1 wherein the generating comprises applying preference values to the tasks.

13. A method as recited in claim 1 wherein the generating comprises tabulating the pair-wise cost associated with each pair of tasks.

14. A method as recited in claim 1 further comprising:

removing the scheduled task from a main task log;

adjusting pair-wise probabilities associated with resources remaining in the main task log based on the scheduled task; and

re-generating the total cost for each task based on pair-wise costs for each task calculated

from adjusted pair-wise probabilities that the task will influence each other task in the plurality of tasks task containers.

15. A computer-readable storage medium storing processor-executable instructions for performing a method comprising:

receiving a plurality of first resource identifiers identifying first resources associated with a first candidate task and selection criteria defining how the first resources are to be selected from the plurality of first resources;

receiving a second resource identifier identifying a second resource associated with a second candidate task;

receiving a current schedule state of scheduled tasks and scheduled resources;

querying a task container that includes an interface function that, when called, determines a pair-wise probability that the first candidate task will influence the second candidate task based on the current schedule state of scheduled tasks, the first resources, the second resource, and the selection criteria;

calculating a pair-wise cost of scheduling the first candidate task based on the determined pair-wise probability; and

scheduling one or more of the first candidate task and the second candidate task based on the pair-wise cost.

16. A computer-readable storage medium as recited in claim 15 wherein the scheduling comprises:

identifying one or more of the first resources that are not the same as the second resource and that satisfy the selection criteria.

17. A computer-readable storage medium as recited in claim 15 further comprising:

determining whether the first candidate task and the second candidate task are viable based on the current schedule state; and

eliminating one or more of the first or second candidate task from consideration if the one or more of the first or second candidate task is not viable.

18. A system for scheduling a plurality of tasks, the system comprising:

a processor;

a task log including a plurality of task objects, each said task object representing a task to be scheduled, each said task object having resource objects, each said resource object representing a resource that is selectable for the associated task according to resource selection logic, and wherein each said task object further includes an interface function that, when called, determines a pair-wise probability that another task represented by another task object will influence the task represented by said called task object, said determination based on a current schedule state of scheduled tasks, resource selection logic associated with said another task object, and resource selection logic associated with said called task object;

a cost generator operable to generate a total cost for each of the tasks based on pair-wise costs for each task calculated from determined pair-wise probabilities that each said task will influence each other said task; and

a scheduling engine operable to schedule the task with the least total cost.

19. (Canceled)

20. (Previously Presented) A system as recited in claim 18 wherein the resource selection logic is selected from a group consisting of:
an "AND" function indicating that all of the plurality of resources are required;
an "XOR" function indicating that one and only one of the plurality of resources is required; and
an "OR" function indicating that at least one of the plurality of resources is required.

21. A system as recited in claim 18 wherein the cost generator is further operable to calculate the pair-wise costs associated with each of the tasks.

22. A system as recited in claim 18 wherein the cost generator is further operable to tabulate the pair-wise costs associated with each of the tasks.

23. A system as recited in claim 18 wherein the task object further comprises time constraint information indicating at least one time constraint between two of the tasks.

24. A system as recited in claim 18 wherein the task log further comprises a hierarchical arrangement of the task objects and the resource objects.

25. A system as recited in claim 18 wherein each task object is operable to return a pair-wise probability that the task object competes with another task object.

26. A computer implemented method comprising:

determining pair-wise probabilities for a plurality of tasks to be scheduled at a computer that each task in a plurality of tasks will influence each other task in the plurality of tasks;

calculating pair-wise costs associated with the plurality of tasks from determined pair-wise probabilities for the plurality of tasks;

generating a total cost associated with each of a the plurality of tasks to be scheduled based on the pair-wise costs for each task, wherein each task requires one or more resources, and wherein at least one of the tasks requires a plurality of resources, and wherein generating the total cost of the at least one task is based on pair- wise costs for the at least one task calculated from determined pair-wise probabilities that other tasks require one or more of the plurality of resources required by the at least one task;

executing a minimum total cost task including allocating resources to the minimum total cost task;

scheduling the minimum total cost task if the minimum total cost task successfully executes; and

reversing side-effects from the executing including deallocating resources from the minimum total cost task if the minimum total cost task fails to execute.

27. A method as recited in claim 26 further comprising determining a pair-wise probability

representing a probability that a first task in the plurality of tasks conflicts with a second task in the plurality of tasks.

28. A method as recited in claim 27 further comprising adjusting the pair-wise probability in response to scheduling the minimum total cost task.

29. A method as recited in claim 26 further comprising determining the total costs based upon preference weights assigned to the plurality of tasks.

30. A method as recited in claim 26 further comprising determining viability of each task in the plurality of tasks.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAROLINE ARCOS whose telephone number is (571)270-3151. The examiner can normally be reached on Monday-Thursday 7:00 AM to 5:30 PM.

5. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

6. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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